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EMERGENCY RESPONSE PLAN (ERP) IN A MANUFACTURING COMPANY: A CORPORATE AWARENESS

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ABSTRACT

The aim of this study is to determine the significance of corporate awareness in initiating an effective Emergency Response Plan (ERP) at a manufacturing company in Senawang, Negeri Sembilan. Five independent variables were used to justify its relationship with corporate awareness: roles and responsibilities, chain of command, control of plant, training and liaison with emergency services. A total number of 210 employees were chosen as respondents for the study but only 145 employees responded to the survey. The Pearson correlation analysis was used to determine if there was a significant relationship between corporate awareness and all the independent variables. The findings showed positive relationship between corporate awareness and all the independent variables (roles and responsibilities, chain of command, control of plant, training and liaison with emergency services). Multiple regressions showed that only chain of command, control of plant and liaisons with emergency services were significant predictors of corporate awareness. It is also suggested that the study would have more significant results with more organization engage in this survey.

Keywords: corporate awareness, roles and responsibilities, chain of command, control of plant, training and liaison

1. Introduction

Many industries, facilities, and government departments in Malaysia still do not give serious emphasis in the development of an efficient Emergency Response Plan (ERP) at its workplace. They highly expect and rely too much on the local fire department, police, and emergency services to respond to the emergency. This understanding is partly correct, but in a growing country like Malaysia, the number of request to respond to the emergency cases has increased. Therefore, there is a need for every entity to have an ERP for their premises so that not only it can assist those agencies in responding to the emergencies or disaster, but most importantly in helping to prevent and minimize the impact of the emergency on the safety and health of its employees and its

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surrounding community. For a business entity, safety and health is part of the business. Failing to prepare and respond to emergency will give a very negative impact to its production and businesses.

In the industrial sector, managing emergency is an obligation of the corporate. The purpose for corporate awareness in initiating an effective emergency response plan within its premises is to ensure that all its employees are safe from all form of hazards at its workplace. It is also to preserve the company facilities and equipment and to protect the community from the impact of emergency that rises from the act of their operation (Stringfield, 2000). In view to protect workers and the surrounding communities from the effect of a major industrial accident, the Malaysian government has approved a bill in Occupational Safety and Health Act (Act 514) 1994, so that all entities have to plan and develop an ERP for their workplace. In the United States, ERP is not only a legal requirement imposed by the federal and state authorities, but also a requirement by the insurance company (Stringfield, 2000).

The aim of this study is to determine the significance of corporate awareness in initiating an effective Emergency Response Plan (ERP) at a manufacturing company in Senawang, Negeri Sembilan.

2. Literature Review

Corporate Awareness

Corporate awareness is about corporate responsibility in how the corporate inculcates knowledge and interest to ensure employees' safety by nurturing and developing an effective ERP (Hiles, 2011). Hartel et al. (1991) discovered that poor situational consciousness was the underlying source that causes 200 aircraft accidents. Endley (1995) further supported this finding by indicating that people who are not alert of situational factors was slower to discover problems and may need more time to solve the problem.

It was also found in Hsu et al. (2010) study that commitment displayed by corporate is a significant factor that contributes to safety supervision and practices in an organization. A similar result was also supported by other safety studies like Dedobbeleer and Beland (1991); Flin et al. (2000) and Zohar and Luria (2005) that identified significant positive impact on safety performance through management involvement and commitment in safety management processes.

Roles and Responsibilities

In emergency response, the understanding of each individual and organization responsibility is important in the making of an effective ERP. The main focus of identifying responsibilities is what they should do and whom to report during an emergency. All level of employees must be trained and given brief on each individual roles and responsibility in response to any emergency or disaster before, during and after an emergency. Emphasis on how to establish communication, managing resources and assets, managing security and safety, and managing utilities are some areas that need attention in defining roles and responsibilities (Joint Commission Resources, 2008). Thus, organization needs to outline roles and responsibility in emergency response through planning. This is further support by Kramer et al. (2009), who stated that for an ERP to work effectively, the roles

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and responsibilities must be assigned to individuals. These people must then be trained in order for them to know and understand their responsibilities.

Chain of Command

One of the elements of ERP is to have a chain of command. Chain of command refers to the incident management of the organization which has got an orderly line of authority within the ranks (FEMA, n. d.). In the event of an emergency or disaster, the chain of command can minimize the confusion among employees and visitors within the plant by taking charge of the situation and making decisive decision in controlling and managing the situation (Gustin, 2010).

The chain of command in an organization must be clear and every individuals who is elected should understand well of their position and responsibilities. The chain of command must be flexible to response to multiple emergencies such as fire, chemical spillage or utility breakdown (Barth et al., 2002). A study by Smith (2010) on respondents that experienced hurricane Katrina in 2005 has identified the failure of the chain of command in providing clear directives and making decision in the management of the disaster. The respondents have requested for an improvement of the state disaster chain of command.

Control of plant

The most important element in the controlling of plant during emergency is having an evacuation plan in place. According to Gustin (2010), evacuation plan must be written and communicated for two reasons. Firstly, the plan will provide the occupants of the building specific information on procedure of an orderly evacuation in the event of emergency or disaster to a safe area. Secondly, the evacuation plan is essential in meeting the requirement of the law in OSH. To achieve an effective response to an evacuation plan, employee needs training. This also includes commander to control the evacuation, the standard procedure, a clear communication system and identifying the escape routes. It is also crucial for the emergency response management committee to work and consult with the fire department, police and other officials to develop the appropriate protocol and procedure for the evacuation plan. Employees must be updated with the evacuation plan and emergency drills must be carried out (Rutherford Silvers, 2004).

Training

Training will enhance the state of readiness of all personnel involved in the emergency response process. By conducting training such as periodic simulation exercise like table-top, full scale mock exercise or fire drills will enable the management to identify the insufficiency of the emergency response management system and the response procedure (Ramabrahman et al, 1996).

A study on emergency preparedness in North Dakota public school district indicated that 36% of the responding school superintendents who took part in the ND LEAD Centre emergency response training has attained a good competency in emergency response while those who had not attended the training was unfortunate and performed poorly (Swiontek, 2009). This was supported by another study of Chen (2009) on cities that performed emergency training and exercise for its employees, where she found that those cities to be more prepared than those cities that conduct lesser training and exercises. This shows that the corporate people are more prepared on emergency situation or disaster by focusing on emergency response training and exercises among its employees.

Liaison with emergency services and local communities

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Communities depend on the fire service and other external emergency services organization for an effective, efficient and safety response to an emergency or disaster. Organizations that have an ERP need to incorporating the services of the fire department, and the emergency services such as medical, police, Red Crescent, Public Works Department, SMART Team, etc. These external services are required not only for suppressing fire which is the common form of emergency, but also providing assistance in a more challenging operation such as specialized and technical rescue, emergency medical services, hazardous materials response, terrorism, road, sea and air accident and to the extent of forest fire, air pollution and earthquake. It is the quick and early response of these services in any incidents that play a key role in deciding the final outcome of the incident (Fleming, 2010).

Different types of emergency require different form of emergency services to deal with the emergencies in ensuring the safety and health of the people. However there are cases where in some emergency and disaster incidents, there are inadequate emergency services supports. This is because the number of emergency services is limited by the geographical factor, time and space, management system, communication system, training and logistic support.

Nik Hisamuddin et al. (2007) study on the emergency medical services (EMS) provider in Malaysia was concerned about the lack of integration between agencies such as the ambulance services, police and the fire departments during an emergency situation. The case is the same for the EMS in Zimbabwe where Thomson (2005) has raised the issues of long emergency response time, long patient transport distance, very high patient workload and poor resources. In a fire incident occurred at a discotheque in Gothenburg 1998, the tragedy that claimed 63 lives and injured 213 was a chaos due to lack of hospital space and inadequate emergency services support (Cassuto & Tarnow, 2003).

Based on above literature, the following research framework was proposed.

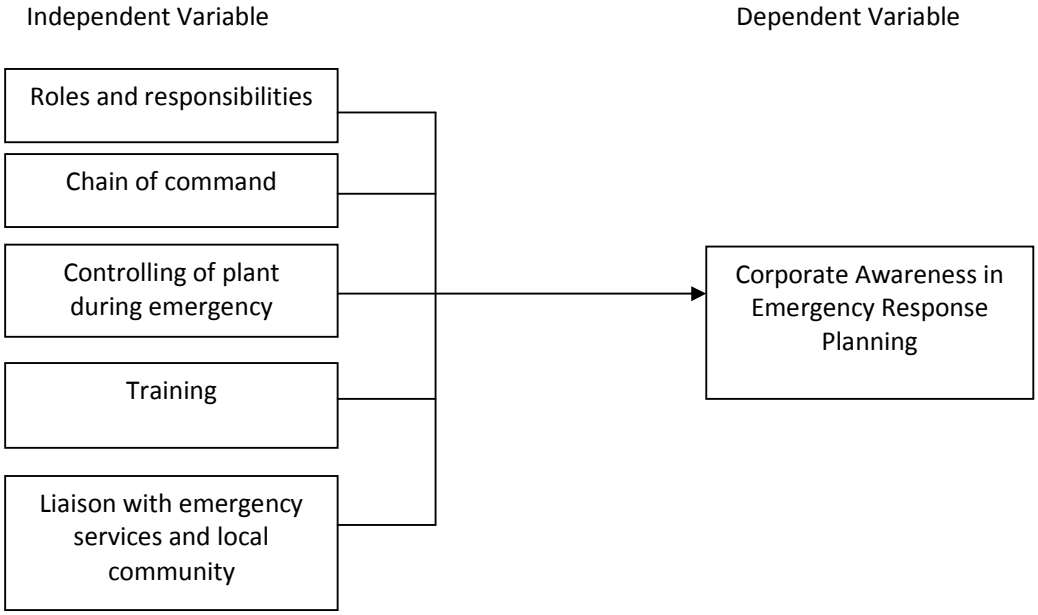

Figure 1. Research framework

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Based on the framework, the following hypotheses were developed:

Hypothesis 1

H1 : There is a relationship between roles and responsibilities for emergency response and corporate awareness in emergency response planning.

Hypothesis 2

H1 : There is a relationship between chain of command to deal with emergency situation and corporate awareness in emergency response planning.

Hypothesis 3

H1 : There is a relationship between provision for controlling of plant during emergency and corporate awareness in emergency response planning.

Hypothesis 4

H1 : There is a relationship between training and corporate awareness in emergency response planning.

Hypothesis 5

H1 : There is a relationship between liaison with emergency services and local community and corporate awareness in emergency response planning.

Hypothesis 6

H1 : The independent variables (role and responsibilities, chain of command, control of plant, training, liaison with emergency services and local community) will influence corporate awareness in emergency response planning.

3. Methodology

This research was conducted at a manufacturing company which is located at Senawang Industrial Park, Negeri Sembilan. A total number of 210 employees were chosen as respondents using simple random sampling but only 145 employees responded to the questionnaire. A pilot test of 51 respondents was conducted prior to the main study. The data was collected from respondents of various departments, who answered the questionnaires on the spot. With the aid of personnel from the Safety and Health Unit, the questionnaires were then collected for analysis.

Data was gathered through questionnaires. It consist of two sections – Section A and Section B. Section A represents respondents' information on gender, age, ethnic, education level, job position and year of services. Questions relating to experience in training and emergency are also in this section. Section B represents the main instrument that relates to the independent variables in this study (role and responsibilities, chain of command, control of plant, training, liaison with emergency services and local community) and dependent variable (corporate awareness). The instrument was taken from Health and Safety Executive (n.d.).

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Data was analyzed using SPSS version 19.0. Data analysis techniques like correlation and multiple regressions were used to measure the data. A significance level of 0.05 is used to analyze the data.

4. Findings

Relationship between independent variables and dependent variable

Five hypotheses were developing to measure the relationship between independent variables (role and responsibilities, chain of command, control of plant, training, liaison with emergency services and local community) and dependent variable (corporate awareness). These hypotheses were tested using correlation analysis.

Table 1

Correlation analysis of independent variables and corporate awareness

	Roles and responsibilities	Chain of command	Control of plant	Training	Liaison with emergency services
Corporate awareness	0.380 ** (p = .000)	0.689 ** (p = .000)	0.597 ** (p = .000)	0.633 ** (p = .000)	0.668 ** (p = .000)

** Correlation is significant at the 0.01 level (2-tailed).

Table 1 shows that there was a positive relationship between roles and responsibilities and corporate awareness with r = 0.380 and p = 0.000; p < 0.05. Thus, hypothesis 1 was accepted. As a conclusion, it was found that there was a relationship between role and responsibilities and corporate awareness.

As for hypothesis 2, Table 1 shows that there was a positive relationship between chain of command and corporate awareness with r = 0.689 and p = 0.000; p < 0.05. Thus, hypothesis 2 was accepted. As a conclusion, it was found that there was a relationship between chain of command and corporate awareness.

Table 1 shows that there was a positive relationship between control of plant and corporate awareness with r = 0.597 and p = 0.000; p < 0.05. Thus, hypothesis 3 was accepted. As a conclusion, it was found that there was a relationship between control of plant and corporate awareness.

As for hypothesis 4 in Table 1, the result shows that there was a positive relationship between training and corporate awareness with r = 0.633 and p = 0.000; p < 0.05. Thus, hypothesis 4 was accepted. As a conclusion, it was found that there was a relationship between training and corporate awareness.

Table 1 also shows that there was a positive relationship between liaison and emergency services with corporate awareness with r = 0.668 and p = 0.000; p < 0.05. Thus, hypothesis 5 was accepted. As a conclusion, it was found that there was a relationship between liaisons with emergency services and local community and corporate awareness.

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Influence of independent variables towards dependent variable

Multiple regression analysis was used to test hypothesis six. Table 2 shows that the regression results revealed the R square value of 0.622. The five independent variables together explain 62.2% of the variance in corporate awareness where the F-value = 45.749 at $p < 0.000$. The magnitude of standard coefficients (Beta), shows that chain of command (0.427) is the best predictor on corporate awareness, followed by liaison (0.381), and control of plant (0.203). Further, of the three dimensions (IVs), only chain of command, liaison with emergency services and control of plant were significant predictors of corporate awareness. Thus, alternative hypothesis was accepted for chain of command, liaison and control of plant.

Table 2
Multiple Regression Analysis Result

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
(Constant)	.907	.259		3.505	.001
ROLE	-.042	.067	-.040	-.632	.529
CHAIN	.400	.070	.427	5.674	.000
CONTROL	.211	.083	.203	2.555	.012
TRAINING	-.041	.077	-.051	-.530	.597
LIASON	.243	.047	.381	5.215	.000

Note:

a. Predictors: (Constant), LIASON, ROLE, CHAIN, CONTROL, TRAINING

r2 = 0.622; p = 0.000; F = 45.749

5. Discussion and Conclusion

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The result of analysis identified that there is a positive relationship between roles and responsibilities and corporate awareness. It has found that the element of roles and responsibilities is important in ensuring the effectiveness of an ERP as profound by Czerwinski (2009), Kramer (2009) and Mcking (2008). This study has found that this manufacturing company needs to transform the roles and responsibilities of the emergency responders in preparing for emergency response since the positive relationship is at a moderate positive sign. It shows that the level of understanding of roles and responsibilities in ERP is still lacking among emergency responders and employees. To improve the situation, management must give attention to achieving functional standard and developing a legal tool to enforce roles and responsibilities performance (Mcking 2008).

The result of analysis shows that there is a significant relationship between chain of command and corporate awareness. This shows that the chain of command has a major contribution to an effective ERP as shown by an above average positive relationship. This requirement is supported by White et al. (2010) and Sene (2008) who stated that many organizations has established their chain of command through the concept of ICS. A study by Smith (2010) proved that effective chain of command is vital in disaster management. The experienced from hurricane Katrina proved the chain of command had failed due to failure of the state authority to make a comprehensive assessment of the disaster.

The result of analysis has shown a significant positive relationship between controlling of plant during emergency with corporate awareness in emergency response planning. This study proves that evacuation plan is important to an organization, where this was supported by a study from Rice (2010) in the state of Florida where he identified those who refuse to leave their houses when hit by hurricane are those who have not experience major hurricane which shows that these people have poor understanding the value of evacuation plan.

It was again reveal that the result shows there is a relationship between training and corporate awareness. The study has similarities with a study by Bavelacqua & Stilp (2009) which established that there is a requirement that all emergency responders and operational staff to be given adequate timely training. In a study by Swiontek (2009), school superintendents that took part in the ND LEAD Centre emergency response training are found to be more competent. This was further supported by Chen (2009), who found that city which performed emergency training for its employees was found to be more prepared for disaster.

From the analysis, it was found that both variables have a significant relationship showing the acceptance of the alternate hypothesis *(H1).* The finding was supported by several studies like the one raise by Nik Hisamuddin et al. (2007) that was concern about the importance of integration between emergency services in providing aid during emergency response to medical needs. In a study by Thomson (2005), he stressed the need for improvement by EMS because the long emergency response time has hampered the effort to provide effective aid to patient or victims of major accident.

This study was to identify the significant relationship of corporate awareness in ERP implemented at this manufacturing company. The result of analysis has found positive relationship between corporate awareness and all the independent variables. Anyhow, the result also shows that the current ERP is still lacking and need improvement. Therefore, it is appropriate that remedial action for continuous improvement be taken by the company. The company also needs to develop a positive safety culture among its employees so that the effort taken by management who had given their commitment will achieve its objective. The company will also need to give consideration for

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organizational change in view of the changing risk and threat. It is also suggested that the study could have more significant results with more organizations engage in this survey.

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